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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,956	10/27/2000	Daniel E. Fisher	001.00001	3189

7590 08/09/2006

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EXAMINER	
CHOW, CHARLES CHIANG	

ART UNIT	PAPER NUMBER
2618	

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/696,956	FISHER, DANIEL E.	
	Examiner	Art Unit	
	Charles Chow	2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15,17-21 and 23-29* is/are pending in the application.

4a) Of the above claim(s) *16, 22* is/are withdrawn from consideration.

5)☒ Claim(s) *3-8,17-21,23, 28* is/are allowed.

6)☒ Claim(s) *1,2,9,14,15,24,25 and 27* is/are rejected.

7)☒ Claim(s) *10-13, 26,29* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/17/2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Detailed Action

1. This office action is associated with the pre-appeal received on 6/8/2006.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 9, 14-15, 24, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson (US 3,816,834) in view of Janc et al. (US 4,893,316) and Weckstrom (US 6,268,829 B1).

For claim 1, Wilson teaches a receiver [Fig. 2, abstract] comprising a processing circuitry for producing a reference signal [18, 24, 26, 22, 35] and

an RF bridge [antenna 4-5, mixer 6, 14, amplifiers 10, 20 & IF mixer 12] coupled to the processing circuitry [18, 22, 24, 26, 35] to receive a reference signals from processing circuitry [receiving 1 MHz reference signal from oscillator 18],

the RF bridge including first and second frequency converters coupled to the antennas [mixer 6,14 coupled to antenna 4, 5 respectively], and

a third frequency converter [12] coupled to outputs of the first and second frequency converters [12 coupled to the outputs of the mixers 6, 14, Fig. 2].

Wilson fails to teach the reference signal being characterized by a constant predetermined frequency.

Janc et al [Janc] teaches these features, the reference quadrature signal form 1976, LO 626 in Fig. 6, is characterized by the clock 1934 of a constant predetermined frequency to generating reference signal cos $2\pi f_c nT$/sin $2\pi f_c nT$ from a clock signal to 644

in Fig. 6], in order to generate accurate, stable local oscillator signal [col. 11, lines 1-5]. Therefore, it would have been for one of ordinary skill in the art at the time of invention to upgrade Wilson with Janc's accurate local oscillator signals, in order to provide accurate, stable, local oscillator signal to Wilson as suggested by Janc.

Wilson & Janc fail to teach placing the above modified circuitry into a processor.

However, Weckstrom teaches the control unit 88, Fig. 5, for processing the information signal received from filter 86 for the antenna direction control having A/D converter 92 & associated functional blocks; the reference clock 104 for generating synchronization reference signal to 98, 102 [col. 9, line 45 to col. 10, line 34]. Therefore, it would have been obvious to place components 18, 22, 24, 26, 35 into the processor of Wilson & Janc that produces the references signal, in order to integrate the circuitry components into a processor I.C. together with software accuracy & reduced circuitry size, less signal delay, to increase the processing speed.

For claim 2, Wilson teaches the third frequency converter [mixer 12 in Fig. 2] provides an information signal that is coupled to the low pass filter 22, but does not specifically disclose the third frequency converter coupled to the processor.

However, Weckstrom teaches the control unit 88, Fig. 5, for processing the information signal received from filter 86 for the antenna direction control having A/D converter 92 & associated functional blocks; the reference clock 104 for generating synchronization reference signal to 98, 102 [col. 9, line 45 to col. 10, line 34]. Therefore, it would have been obvious to place components 18, 22, 24, 26, 35 into the processor of Wilson & Janc that produces the references signal, in order to integrate the circuitry components into a processor I.C. together with software accuracy & reduced circuitry size, less signal delay, to increase the processing speed. By doing so, the third frequency converter 12 of Wilson will be "coupled to the processor".

For claims 9, 27, Wilson teaches a receiver [Fig. 2, abstract] comprising an rf bridge

[antenna 4-5, mixer 6, 14, amplifiers 10, 20 & IF mixer 12] and a processing circuitry [18, 24, 26, 22] coupled to the rf bridge to receive an information signal from the rf bridge [the low pass filter 22 receiving output signal from mixer 12],

the reference signal [I MHz signal from oscillator 18] being coupled to the rf bridge above, and

Wilson fails to teach the processing circuitry including a digital source to generate a reference signal based on a signal from a clock source.

Janc teaches the processing circuitry including a digital frequency source to generate a reference signal based on a signal from a clock source [the processor circuit 1920 includes a digital source generator 1976, LO 626, to generate reference quadrature signal from clock source 1934, Fig. 6, col. 11, lines 12-23 & col. 12, lines 1-60], in order to generate accurate, stable local oscillator signal [col. 11, lines 1-5].

Wilson & Janc fail to teach the circuitry to detect a frequency difference from the information signal based on a reference signal, and the processor.

However, Weckstrom teaches the circuitry to detect a frequency difference from the information signal based on the reference signal [68 detects a frequency difference from signal output from 80, 62, col. 8, lines 15-35], and

the processor [the control unit 88, Fig. 5, for processing the information signal received from filter 86 for the antenna direction control having A/D converter 92 & associated functional blocks; the reference clock 104 for generating synchronization reference signal to 98, 102 [col. 9, line 45 to col. 10, line 34]. Therefore, it would have been obvious to place components 18, 22, 24, 26, 35 into the processor of Wilson & Janc that produces the references signal, in order to integrate the circuitry components into a processor I.C. together with software accuracy & reduced circuitry size, less signal delay, to increase the processing speed.

As to the argument that the circuitry detects from the same clock source, since the claim does not recite that the clock source is directly connected to the circuitry, then it is still considered that the circuit described above is "based on the signal from the clock source".

For claim 14, Wilson teaches a receiver [Fig. 2] wherein the rf bridge [antenna 4-5, mixer 6, 14, amplifiers 10, 20 & IF mixer 12] includes

first and second rf frequency converters [mixer 6, 14] coupled to respective first and second antennas [antenna 4-5]; and

a third rf frequency converter [12] coupled to outputs of the first and second rf frequency converters [outputs of mixer 6, 14].

For claim 15, Wilson teaches a receiver [Fig. 2] wherein the first and second rf frequency converter [mixer 6, 14] receiver respective first and second signals from the respective first and second antennas [signals from antenna 4 & 5]; and

the third rf frequency converter [12] heterodynes signals from the first and second rf frequency converters [mixer 6, 14] to provide a signal that is characterized by a frequency difference modulated onto the reference signal [signal from oscillator 18],

the frequency difference being a difference between a frequency of the first and a frequency of the second signal [the frequency difference of the first & second signal from antenna 4, 5].

For claim 24, Wilson teaches the wherein the reference signal is coupled to only one of the first and second frequency converters [the reference signal from oscillator 16 is only coupled to mixer 14, but not coupled to mixer 6, Fig. 2].

3. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson (US 3,816,834) in view of Weckstrom.

For claim 25, Wilson teaches a receiver [Fig. 2, abstract] comprising a processing circuitry

[circuitry elements oscillator 18, filter 22, phase detector 24, storage 26 & 35].

an RF bridge [antenna 4-5, mixer 6, 14, amplifiers 10, 20 & IF mixer 12] coupled to the processing circuitry [18, 22, 24, 26, 35] to receive a reference signals from processing circuitry [receiving 1 MHz reference from 18],

a RF bridge including first and second frequency converters coupled to respective first and second antennas [the mixer 6,14 coupled to antenna 4, 5 respectively],

the reference signal being coupled to only one of the first and second frequency converters [the reference signal from 16 is only provided to mixer 14, but not for mixer 6, Fig. 2] ; and

a third frequency converter [12] coupled to outputs of the first and second frequency converters [12 coupled to the outputs of the mixers 6, 14, Fig. 2].

Wilson fails to teach placing the above processing circuitry in a processor.

However, Weckstrom teaches the control unit 88, Fig. 5, for processing the information signal received from filter 86 for the antenna direction control having A/D converter 92 & associated functional blocks; the reference clock 104 for generating synchronization reference signal to 98, 102 [col. 9, line 45 to col. 10, line 34]. Therefore, it would have been obvious to place components 18, 22, 24, 26, 35 into a processor that produces the references signal, in order to integrate the circuitry components into a processor I.C. together with software accuracy & reduced circuitry size, less signal delay, to increase the processing speed.

Allowable Subject Matter

4. Claims 3-8, 17-21, 23, 28 are allowable over the prior art of record.

The following is the examiner's statement for the reasons of allowance:

Claims 3-8, 17-20, 23, 28 are allowable over the prior art of record, which has mailed out in the previous office action, that the prior arts fail to teach singly, particularly, or in combination, the subject matter, for the **structures** in **claims 3, 5, 6, 21; the first and second center frequency** of

the forming a first & second Fourier transform of the information in claim 17; the features for the **wherein the integration interval is inversely proportional to a difference between the first center frequency and the second frequency in claim 18**; the **digital frequency source to generate a reference signal** using a signal from a clock source in **claims 9, 27**.

The dependent claims are also allowable due to their dependency upon the independent claims and having further claimed features.

The closest prior art to **Johnson (US 4,245,220)** teaches the first, second, third frequency converters having two antennas for calculating the frequency difference to determining the target location (abstract, frequency different Af x (t/T) in col. 2, lines 7-16; the analyzing using processor for the signals from filter bank; col. 2, lines 54-600; the frequency difference in col. 3, lines 55-60; £f in col. 2, line 61 to col. 3, line 5). Johnson fails to teach the **structures** in claims 3, 5-6, and the where the **integration interval is inversely proportional to a difference** between the first center frequency and the second frequency.

Wilson (US 3,816,834) & Weckstrom (US 6,268,829 B1) as shown in office action above, are also considered, they fail to teach the above allowable features.

Other prior arts are considered but they fail to teach the above allowable features.

Masheff (US 4,876,549) teaches the control circuit 60 for generating clock pulses on line 62 for the direction finding apparatus [abstract, Fig. 2, col. 5, lines 4-39], but fails to teach the **digital frequency source** to generate a reference signal.

Stone (US 3,680,124) teaches the determining of the azimuth information from the signal difference from antennas 27, 29 [Fig. 8], the first, second frequency converter 65, but failed to teach the fourth frequency converter & the additional up converter/down converter coupled to the rf bridge and processor, having first, second Fourier transform center frequency.

Cash (US 4,509,052) teaches the interferometer/Dopper target location system (abstract, 1-6), frequency converters 10/12, for measuring elevation angle, azimuth angle and range (abstract, summary of invention, his claims 1, 10), the processor 34 to analyzer frequency difference according to equations (col. 7, lines 3-24).

DesJardins (US 5,570,099) teaches the accurate range and frequency calculation FDOA, using digital signal processing, Hilbert transforms, FIR filters, to analyzing two antenna received signals, to locating a transmitter (abstract, Fig. 1-3, col. 3, lines 35-59; col. 2, line 65 to col. 3, line 25; col. 5, lines 37-45; col. 3, lines 17-31).

Reference, **Carr et al. (US 4,845,502), Masheff (US 4,876,549), Herrmann et al. (US 6,313,79 B1), Morita (US 5,355,767), Kasperkovitz et al. (US 6,784,836 B2), Houghton et al. (US 5,955,993), Kushihara (US 5,796,357), Mruphy et al. (US 5,541,608), Timothy et al. (US 6,366,240 B1), Parl et al. (US 6,259,404 B1), Jones et al. (US 6,392,598B1), Storey Jr. (US 4,771,290), Janc et al. (US 4,893,316),** are considered but failed to teach the above allowable features.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Claims Objection

5. Claims 10-13, 26, 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art fails to teach the first & second center frequency in claim 10, 26; the digital frequency generator that generates a second digital signal at the second center

frequency coupled to the second Fourier transform in claim 11; the frequency discriminator coupled to the first and second Fourier transformers in claim 12; the structure & shifting of the frequency of information signal to a frequency in between the first & second center frequency in claim 13. The cited references fail to teach the structure of the rf bridge having a fourth rf frequency converter in claim 29.

Response to Argument

6. Applicant's arguments with respect to claims 1-15, 17-21, 23-29 have been considered but are moot in view of the new ground(s) of rejection.

Regarding applicant's argument that there is no motivation to combine Janc's quadrature signals of the LO 626 in Fig. 6 to Wilson, Janc teaches the quadrature output signals from the digital LO 626 of the DZISS-1920 in Fig. 2, having digital processing circuitry. The quadrature reference signal of LO626 is characterized by a constant predetermined signal from clock 1934.

Regarding the argument, for claim 2, that Wilson fails to teach the features in claim 2, [page 2 of applicant's amendment],

Wilson teaches the output of third frequency converter [mixer 12] is coupled to the low pass filter 22.

Weckstrom teaches the control unit 88, Fig. 5, for processing the information signal received from filter 86 for the antenna direction control having A/D converter 92 & associated functional blocks; the reference clock 104 for generating synchronization reference signal to 98, 102 [col. 9, line 45 to col. 10, line 34]. Therefore, it would have been obvious to place components 18, 22, 24, 26, 35 into the processor of Wilson & Janc that produces the references signal, in order to integrate the circuitry components into a processor I.C. together with software accuracy & reduced circuitry size, less signal delay,

to increase the processing speed. By doing so, the third frequency converter 12 of Wilson will be "coupled to the processor".

As to the argument that the circuitry detects from the same clock source, for claim 9, 27, since the claim does not recite that the clock source is directly connected to the circuitry, then it is still considered that the circuit described above is "based on the signal from the clock source".

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles C. Chow whose telephone number is (571) 272-7889. The examiner can normally be reached on 8:00am-5:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (571) 272-7899. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Charles Chow CC.

August 4, 2006.

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